» Inequalities in Supra-Regional Eurasian Exchange Networks (8000 – 2000 BP) «

Big Exchange: Towards a network for networks of networks

Johanna Hilpert and Tim Kerig (Cluster of Excellence ROOTS/Kiel)

Social interaction creates networks. Exchange networks are archaeologically reflected in the distribution of finds in space and time. The understanding of social networks in terms of their basic structure and development is essential for the consideration of inequality, violence or knowledge transfer in the prehistoric context. The network structure and the positions of the individual actors are in close interaction with social characteristics of the societies behind them. For example, group size influences features of exchange networks, and the social position of individual actors or actresses ultimately determines the weight of their connectivity. Archaeological distribution maps of raw materials and objects with a pan-European spread and with a clearly determinable origin are a long known expression of these networks. Network analytical methods allow quantification of network properties and their correlation in time and space with proxies of social evolution.

The quantifying approach and the large-scale consideration of long time spans set the framework for the conference. Experts from different disciplines are brought together to discuss the research results and to develop new approaches from a network perspective. Synergy effects are expected to emerge from the broad background of the presenters in terms of methodological and theoretical approaches as well as from the different expertise in terms of time horizons and networks.

Here, we present a LBK case study. Different raw material networks are connected to form a single network. We focus on raw material sources located outside of the areas settled by the first agriculturalists. At this level, the formation of cliques can be observed. These cliques do not necessarily coincide with local ceramic groups. External arguments (violence, environment,...) are considered to interpret these exchange relations and group formation.

Characterizing Resource Networks through Point Pattern Analysis and Unsupervised Data Mining Techniques

Steffen Strohm (CRC 1266 Scales of Transformation/Kiel)

Over the course of the interdisciplinary “Big Exchange” project, a large body of literature and other data sources has been investigated to collect information about finds of certain resources, e.g. flint, jade, spondylus etc. These archaeological finds are commonly linked to a particular location and a dating on different levels of quality and/or accuracy. From these collections, data point distributions were extracted, focusing on material type, location and dating. This session aims to provide an overview of the distributions of all archaeological finds considered in the project so far. In a first step, the distributions are presented for visual analysis and interpretation, but also characterized using density functions and clustering techniques. This allows to compare these data foundations of latent exchange networks with each other. The second goal is to highlight relevant overlaps between data point distributions of different resources, since a spatial overlap alone might not be of the same interest as an overlap in space and time.

Inland and maritime paths of Neolithisation in the Central and Western Mediterranean. The case of the submerged site of 'La Marmotta' (Anguillara Savazia, Rome, Italy)

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Gerard Remolins (Regirarocs/Andorra)
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The Neolithic not only implies a change in the subsistence and diet, but as well a radical change in technological and social organization. In this sense, one of the most interesting aspects to be analysed is the emergence and organization of the Neolithic interaction networks. Networks probably played a fundamental role in the rapid expansion of farmers across the Mediterranean.

La Marmotta, with the materials recovered from eighteen years of excavation, offers a broad array of artefacts and raw-materials indicating the existence of a complex and large interaction network. Pottery tradition, lithic tools, polished tools, beads and other ornaments, and even materials such as the resins used for hafting give us insights into the Neolithic networks.

The village probably played a key role in the Mediterranean and Italian Neolithic. Multidirectional contacts are visible, suggesting that this community established networks and received influences from different geographical and cultural areas, probably including also Mesolithic hunter-gatherer populations.

Various forms of distant contacts: from family exchanges to migrations…Circulation networks at the cusp to the Vth millennium in North-Western Europe

Solène Denis (Masaryk University, Department of Archaeology and Museology/Brno)

The beginning of the Vth millennium BC is marked by a restructuration of siliceous raw material circulation networks after their collapse at the end of the LBK. They are often considered more regional. This paper will be dedicated to exploring the various forms of distant contacts between communities thanks to lithic technology analysis. We will take different examples from the transition to Blicquy/Villeneuve-Saint-Germain in Northern France and Belgium and to the Hinkelstein/Grossgartach in Rhineland. From a methodological point of view, we will focus on the possibility to distinguish different kind of networks and their relevance to bring new insights into the social and economic organizations of these agro-pastoral populations.

« Le phénomène pressignien » : The spread of large flint blades in the Neolithic

Nicole Mallet (Association des Amis du Musée de Préhistoire du Grand-Pressigny/Grand-Pressigny)
Jacques Pelegrin (Directeur de recherche au CNRS, UMR 7055 PreTech/Nanterre)
Christian Verjux (Conservateur, Ministère de la Culture, UMR 7055 PreTech/Bordeaux)
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The Grand-Pressigny region, located in the southern part of the Paris Basin, is known worldwide for ist exceptional production of very long flint blades at the end of the Neolithic period. These were produced by highly specialized craftsmen, true master knappers.

This production is both remarkable for its duration and volume, as thousands of blades were produced annually for nearly six centuries between 3000 and 2400 BC. Its distribution across a large part of Western Europe extends over 900 km to Northern Germany and more than 600 km eastward to the western shore of Lake Constance in Switzerland and Southern Germany. This phenomenon covers the whole of France, the Benelux countries and Switzerland as well as part of the Rhine and northern Germany, without however having crossed the Pyrenees or having reached Great Britain.

This diffusion, recognized very early on in the 1880s, is now confirmed by an in-depth survey, published at the end of 2019, based on a petrographic study of the flint of the Pressignian region. They have not only allowed us to count more than 7000 pieces exported from the region's flintknapping workshops (beyond 50 km, but also to determine an evolution of blade production between the Middle Neolithic and the very end of the Neolithic.

The talk will include research history, the contexts of discovery of Pressignian flint blades and tools as well as their function and use. Further on, it will discuss the temporal evolution of the Grand-Pressigny distribution and the mechanisms and the socio-economic dimension of ist diffusion.

Ivory Exchange Networks during the Chalcolithic and Early Bronze Age of the Iberian Peninsula

Thomas X. Schuhmacher (Deutsches Archäologisches Institut/Madrid)

The studies on ivory objects from the Chalcolithic and Early Bronze Age of the Iberian Peninsula and Northwest Africa demonstrated that the consumption of ivory objects on the Iberian Peninsula was more important than previously thought. The beginning of ivory use at the end of the 4th mill. BC corresponds with the start of social complexity and the birth of an elite based on prestige. It is possible that this sudden beginning on the Iberian Peninsula in part was due to northward movements of population – and elephants – in Northwest Africa caused by the drying of the Sahara region. By scientific analysis two different exchange networks of ivory during the Chalcolithic could be recognised, by which on one hand Asian ivory reached the Southeast of the Iberian Peninsula and the Guadalquivir estuary and on the other hand African ivory from the Maghreb came to southwestern Spain and Portugal. In the Chalcolithic local elites maintained this exchange network in order to obtain exotic objects by peer-polity interaction to express their prestige and power. Mainly raw material came to the Iberian Peninsula, where it was processed locally, redistributed and consumed in elite burials. The exchange of ivory could also have contributed to the development of a local elite in Northwest Africa. During the Early Bronze Age the perception and social value of ivory changed. Prestige or rank was no longer achieved and expressed by exotic objects obtained by exchange, maybe even the importance of long and middle range exchange as a whole diminished. What refers to ivory, only the exchange with Northwest Africa was going on, whereas the Mediterranean network was abandoned.

Circulation of Alpine jade axeheads in Neolithic Europe: network and flow modelling of an 'object-sign'

Estelle Gauthier and Pierre Pétrequin (MSHE Claude Nicolas Ledoux and UMR CNRS 6249, Chrono-environnement/Besançon)

Coming from the high-altitude quarries of the Mount Viso and the Mount Beigua in the Italian Alps, jade products (polished axes and disc-rings were distributed throughout the Neolithic Europe in the Vth and IVth millennia BC. After thirty years of research, Pierre and Anne-Marie Pétrequin realized an inventory of long jade axeheads that is considered being representative for Western Europe. Two successive financed

research programs have made it possible to specify the different aspects of the production, the consumption and the modes of transfer of these socially-valued object-signs which have crossed many cultural borders on the occasion of contacts between elites. The multiplicity of transfer networks, selection phenomena aiming to increase the added value of the objects, the regional transformations of the most beautiful pieces in order to boost their symbolic value, all these particularities prove that the transfers of jade axes are linked to very complex diffusion processes, where social, political and cultural factors surpass economic and technical questions. A detailed study of the data collected on the objects allows us to reconstruct the different stages of their own history and the routes along which they circulated. Using a Geographic Information System and spatial analysis methods, we are now proposing a model of transfers of long axes in Alpine jades on the scale of the Western Europe.

Oxhide ingots and the Late Bronze Age metal trade in Europe and the Mediterranean

Serena Sabatini (University of Gothenburg/Gothenburg)

Relatively recent analyses on bronze and copper finds from Scandinavia provided a relevant idea of the complexity of the European Bronze Age metal trade. The discovery that among others also Cypriot, Sardinian, and Spanish copper had been likely used to manufacture several artefacts was a highly unexpected result. It not only forced to question earlier thoughts about the way long-distance networks throughout the continent unfolded, but also helped to reassess the fundamental role of maritime connections and seafaring. Importantly, it also shed light on the western Mediterranean as a metal producing region. There are however still major gaps in our knowledge of how metal trade and exchanges unfolded between Scandinavia, Atlantic Europe and the Mediterranean. One possible actor actively managing at least part of the trade/exchange patterns has been recently proposed to be Nuragic Sardinian. Sardinia is also the European region where the largest number of oxhide ingots has been found so far. The paper intends to explore the role of this specific class of material in the wider picture of the long distance metal trade across western Eurasia during the second half of the second millennium BC.

The Late Bronze Age oxhide ingots are an intriguing class of objects. Their amazing number, their enduring chronology, the wide distribution and their puzzling characteristics have long attracted scholars' attention. The shipwrecks along the southern coast of modern Turkey leave no doubt about their use as means of transportation of copper and tin, but the evidence suggest they were more than just ingots. Their numerous hoards from Sardinia above all suggest that they might have had a value of their own and that their thesaurization/accumulation might have a significant symbolic role. Their miniature reproduction and their likely representation on Egyptian temple wall as much as on Scandinavian rock art suggest a spread knowledge linked to, but also beyond their value as ingots. Overall, oxhide ingots provide a glimpse into the extraordinary complexity of the Late Bronze Age metal trade.

Hot spots and gaps of tin bronze procurement - why equality was never an option

Bianka Nessel (Johannes-Gutenberg Universität/Mainz)

Many studies that deal with the spread of tin and early tin bronze focus on the areas of origin of the respective raw materials and the occurrence of individual artifacts at certain sites. Areas or communities, which are slow to embrace bronze metallurgy, are, however, investigated less intensively. In some cases, they are even described as "backwater regions" at least for the considered timeframe. But why do communities reject or ignore something, which has such a huge impact on so many levels of everyday life? This study focuses on identifying and interpreting the reasons behind hot spots and gaps of tin bronze procurement in the second half of the 3rd and first half of the 2nd millennium BC. It seems that not only the peculiar organization but especially the longevity and stability of communities are major aspects regarding the participation in supra regional networks, which is in most regions necessary to procure

copper and tin. But what exactly do we know about these networks? Did they bring raw material and technological knowledge only to "centers" or also to remote destinations? This research aims to get a better understanding of the mechanisms behind large-scale exchange networks for tin and bronze in Europe and their development in time and space.

Tracing tin sources in the Bronze Age: Possibilities and limitations in using tin isotopes and alternative approaches for reconstructing metallurgical networks

Daniel Berger (CEZA/Mannheim)

This lecture deals with tin isotopy as a new tool in the analytical study of archaeological tin and bronze objects. The method was systematically investigated in 2013–2018 as part of an interdisciplinary project for its applicability in cultural studies and its potential for reconstructing the tin sources of the Bronze Age. Since then, it has been used routinely in archaeometallurgical studies. However, contrary to initial expectations, tin isotope analysis is capable of providing only limited information on the origin of Bronze Age tin, as the tin ores in question do not have clear isotopic fingerprints. However, by combining them with other analytical proxies such as lead and copper isotopic data and the chemical composition of metal objects as well as archaeological information, tin isotopes can help to answer questions that go far beyond the origin of the tin. The lecture will demonstrate by means of some examples how isotopic and chemical data can be used to gain information about the production of artefacts and, in particular, about the mixing and recycling of metal. These findings, in turn, can provide valuable insights into the origin and connections of artefacts and thus also into metallurgical networks and cultural interactions.

Amber Networks in the European Bronze Age

Benjamin Serbe (Cluster of Excellence ROOTS/Kiel)

Prehistoric amber trade is not something new to archaeology, but since the introduction of the "Amber Road" nearly 100 years ago concepts and methods changed. Amber itself is a well known trade object and of particular interest because of it's general features. It is lightweight, easy to transport, has no functional value and fixed origins. With the beginning of the Bronze Age amber was disseminated all over Europe, many argue, as a result of the spread of the bronze technology. Different forms of amber beads, but-tons and pendants may be beneficial for discovering exchange networks between different communities throughout Europe.

This research project aims to record the archaeological amber finds from Europe and to discuss amber exchange and the so called "Amber Route" from a modern methodological background, namely network analysis.

A multiscalar approach to pre-monetary exchange networks: a case study from Early Bronze Age Anatolia

Michele Massa (University of Chicago – Oriental Institute/Chicago)

Employing Early Bronze Age Anatolia as a case study, this paper presents a conceptual and methodological framework to analyze exchange networks that operated at different spatial and social scales.

It explores the different physical and social components of networks, focusing on how landscape and transport technology affected movement (hence interaction, and how cultural structures impacted on the reception of goods and information across different communities. It also assesses the correltion between network size and the degree of specialization in the organization of production and distribution

of exchanged goods. Through the spatial distribution analysis of a large range of raw materials, finished products, technologies and ideas, the paper further identifies local, regional and interregional exchange networks in 3rd millennium BCE Anatolia.

It concludes by suggesting that, while partially overlapping and employing the same physical space, networks of different sizes operate through different socio-cultural and economic mechanisms.

Types of inequality, trade networks and measuring materials

Toby C. Wilkinson (Institut Català d'Arqueologia Clàssica (ICAC/Tarragona)

Archaeology has recently begun an "inequality turn". Many current projects and recent publications are concerned with the inequality in the past, often with a focus on its supposed origins. There are, however, many forms and axes of inequality and it is easy for us to conflate them and assume that evidence for one type correlates with another. We cannot assume that the drivers for each are the same. The idea that trade networks are responsible for large-scale inequalities has been a common theme in archaeological and wider "development" economics since Wallerstein's influential introduction of the concept of "world-systems". According to this approach, the unequal geographic distributions of "raw materials" creates an automatic potential difference in initial material wealth and sets up the conditions for trade in which resource-poor regions (e.g. Mesopotamia seek access to exotic and desirable raw materials (such as metals in resource-rich neighbours (e.g. highland Anatolia, Iran etc. in exchange for added-value processed products (such as textiles. World-systems analysis points to the structural imbalance created by the asymmetric relationships between the consuming "core" and producing "periphery". This form of inequality is both structural and regional, one we may be able to observe via archaeological proxies, but not necessarily measure. But to what degree was this regional-scale inequality palpably experienced by communities at either end of the networks? Can we plausibly talk about inequality at the grand scale of trade networks, which grew in size and density in Eurasia particularly from the 3rd millennium BC onwards? This paper will argue that we need to look in some less obvious, and non-continuous categories of material evidence to delineate the range of inequality regimes at work. It will draw out the difference between "categorical" and "linear" inequalities, and examine the role of ancient metrology that enabled certain kinds of inequality. Without a linear metrological cognitive frame, the type of inequality we most commonly talk about today (wealth inequality, measured by money, could not even exist.

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